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Salient Features of Labour use in Rural India

For a long time the decennial population censuses were the only source of information on the pattern of employment in rural India : Every census gives some idea of the proportion of rural population engaged in economic activity, and their distribution by sector of employment. Pretty detailed sectoral break-up of the working population is generally available upto the State level, though at the district level only broad sectoral pattern of employment is published. However, problems of determining the activity status of particular individuals, the fact that workers often do several types of work covering different 'sectors', and the difficulties of capturing the intensity of employment in a short questionnaire administered at a single point of time have severely limited the usefulness of their data. In order to overcome these problems, the NSS took up intensive surveys of a scientifically selected sample of the population from rural and urban areas all over India. Though these surveys were started in the fifties, it took time to evolve suitable standardised concepts and procedures - a

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* This is a contribution to a study of labour absorption in rural areas undertaken at the Centre for Development Studies, Trivandrum under the auspices of the ICAR. The project, jointly initiated by the author and Chiranjib Sen; variation a macro analysis (which is covered by the present paper) and an analysis of farm level variations in Tamil Nadu and Kerala (currently being done by Chiranjib Sen).

** I am grateful to C.T.Kurien, S.Subramanian, K.Nagaraj (all of MIDS) G.Parthasarathy (Andhra University) and especially to S.D.Tendulkar, K.Sundaram and Mahendra Dev (Delhi School of Economics) for their comments and suggestions. The usual disclaimers apply. I am also thankful to Asha Krishnakumar for her generous assistance with computation.

process which was greatly facilitated by researchers who sought to understand the various facets of manpower utilisation by using the NSS and other data (See especially the Dantwala Committee Report 1972 and papers presented at a seminar held in Centre for Development Studies, 1975). This process was largely completed by the early 1970's. Since that time the NSS has not only been careful to maintain comparability of design, concepts and procedures, but has also published rather detailed tabulations which give a fuller and more meaningful picture of the composition of the labour force, level and pattern of employment and incidence of unemployment.

Rural Labour in 1977-8 : A National Profile

In 1977-8 the estimated working population - i.e., persons usually engaged in productive activity1/ - in rural India was around 198 million; including the usually (i.e., chronically) unemployed, the labour force (in terms of usual status) was around 201 million. The labour force consisted of 139 million males and 61 million females representing about 65% and 39% respectively of the total population of the two sexes aged 5 years or more.

More than 60 per cent of both male and female workers in rural areas were self-employed or employed in family enterprises; the remainder were wage labourers. Somewhat more than fourth of the male wage labourers were working on regular wage salaried employment, the rest being casual labourers. Most (over 90%) of female wage labourers were in

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1/ This category is called "main workers". Including "marginal workers" raises the number to 229 million, the difference being mostly under females.

the latter category.

In terms of their usual status about four-fifths of the rural male workers[1/] and 86% of females were employed in agriculture (including animal husbandry, fisheries and forestry). Mining and manufacturing (including utilities) absorbed a little over of 7% of male workers (6% among female); and trade transport and finance (5.5%) among (2% females); and services 5.1% (3% among females).

Not all people classified as 'usual workers' are employed all the time. A better measure of employment would be in terms of the number of days worked: on an average day, only 56.1% of males actually had work while 64% were categorised as workers according to their usual status. The difference is even more marked in the case of females where the comparable proportions are 22% and 38% respectively. Also the extent of unemployment measured with respect to the daily status is considerably higher than with reference to usual status: while barely 1 per cent of the male workers (according to usual status) report themselves to be chronically unemployed, unemployment measured on the basis of current daily status works out to over 7% of the labour force.

Altogether in 1977-8, an estimated 62.7 billion persondays were spent on economic activity[2/]; reported unemployment was 4.7 billion mandays. Roughly four fifths of the total workdays is spent in agriculture - 78% among males

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1/ Main plus marginal

2/ This estimate of employment in persondays and its composition is from the NSS and relates to main workers.

and 83% among females. A little over 70% of the total employment (in terms of persondays) is accounted by males; two thirds represents the contribution of self-employed (own account workers and their family helpers). Of the remainder, which measures the extent of wage paid employment, almost three fourth (72%) is accounted by casual wage labour. The incidence of wage employment relative to total employment is relatively higher in non-agricultural sectors (48% compared to 30% in agriculture); over half of rural non-agricultural wage employment is on a regular basis while over 80% of wage employment in agriculture consists of casual labour. The incidence of casual wage employment is also much greater among females. (Table 1) The data also suggest that while most of the casual non-agricultural employment is in manual work, about half of regular wage employment is non-manual work.[1/]

Table 1 : Pattern of labour use in rural India 1977-78

10^9 days/annum

	All Activities				Agriculture			
	Family	Regular employees	Casual labour	Total	Family	Regular employees	Casual labour	Total
Male	30.2	5.3	9.7	45.3	25.2	2.4	7.8	35.4
Female	11.0	0.8	5.6	17.3	9.3	0.3	4.8	14.4
Total	41.2	6.1	15.3	62.6	34.5	2.7	12.6	49.8

Source : Sarvekshana, J-O 1981: S37-S38

The NSS also gives some idea of the break-down of agricultural work by major operations. These data, summarised in Table 2, shows ploughing, sowing, transplanting, weeding

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1/ Sarvekshana, J-O 1981 : S37-S38.

and harvesting - which are all important operations in crop production-account for barely two-fifths of the total labour use (in terms of persondays) in this sector. About 5 per cent is used for non-manual work - presumably supervision. But over 55% of the labour input is classified as "other manual work" : A finer breakdown of this category would be useful to get a proper appreciation of the importance of other operations related to crop production, and of activities other than crop production (such as animal husbandry).1/

There are also marked differences in the relative importance of female labour between different operations: They figure prominently in transplantation, weeding and harvesting: in fact they out number the males in the casual labour category in the latter two operations, but are relatively less important or play a minor role in others (notably ploughing and non-manual work).

Changes over time

The NSS also provides the estimated population and its employment characteristics on the basis of sample data for 1972-73, 1977-78 and 1983. They suggest that the labour force participation rates in terms of usual status of males aged 5 or more years has remained more or less stable during this period, while that of females shows a slight increase in the latter part of the period compared to 1972-73. However the work force participation rates in terms of current daily status - whice are invariably lower - show a progressive decline in the case of males; a fall between

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1/ In terms of "usual" status, about 90% of the persons (main and marginal works) who report their usual activity to be agriculture and related activities, report themselves to be in agricultural production (including plantations) a little over 9% in livestock and the rest in fisheries, forests, etc. I am grateful to K.Sundaram for giving these figure which he reconstructed from unpublished tabulations.

Table 2 : Distribution of employment (in person days) in agriculture by operations, categories of labour and sex, all India 1977/78

Operations	% distribution of total labour input			Ratio of female to male labour by type of labour			
	male	female	total	all	family labour	casual labour	regular workers
Ploughing	14.0	1.5	10.3	0.043	0.04	0.05	0.003
Sowing	2.0	1.6	1.9	0.332	0.27	0.61	0.11
Transplantation	2.7	5.8	3.6	0.863	0.50	1.53	0.45
Weeding	7.2	14.7	9.7	0.831	0.66	1.32	0.22
Harvesting	12.7	19.5	14.7	0.629	0.52	0.90	0.23
Other manual work in agriculture	55.9	53.8	55.8	0.393	0.40	0.47	0.11
Non-manual work in agriculture	5.5	3.1	4.8	0.227	0.23	0.32	0.08
Total	100	100	100	0.408	0.37	0.62	0.11

Sarvekshana, J-O 1981 S37-S38

1972-73 & 1977-78 and stability thereafter in the case of female[1/] (Table 3). This would seem to suggest average duration of employment per usually employed worker (measured by the ratio of CDS to US participation rates) has fallen over this period; but almost all of it occurred between

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1/ Sundaram has drawn my attention to the possibility that part of the decline in CDS employment rate may be due the introduction in 1977-8 of a separate and explicit category (93) for those combining domestic work with free collection of fuelwood etc. In 1972-73 since this category was not recognised, some of the fuelwood collection etc. may have been recorded as "work". However this would make a significant difference only to the estimate for females.

1972-73 and 1977-78. This index does not show any change - if any thing there is a marginal improvement - in 1983 compared to 1977-78.

Table 3 : Labour force participation rates* in rural India

	1972-73 US	1972-73 CDS	1977-78 US	1977-78 CDS	1983 US	1983 CDS
Male	64.6	58.0	64.9	56.1	64.2	55.4
Female	37.7	25.2	39.3	21.6	39.1	21.8

* % of population in each sex aged 5 or more years who are in the labour force (= working population + unemployed). Includes main and marginal workers.

US = Usual Status; CDS = Current Daily Status

Source : GOI, NSSO (1985)

There has been a progressive and substantial decline in the proportion of male workers in the self employment category. Among females, the proportion fell in 1977-78, - the fall being some what less pronounced than among males - but did not change thereafter. The obverse of this phenomenon is the progressive rise in the share of wage labour in the work force - from 34% to 40% in the case of males and 36% to 38% among females. Another significant trend is growing casualisation of wage labour, the tendency being again more pronounced among males: male casual wage labourers as a proportion of male wage labourers rose from 64% in 1972-73 to 73% in 1983. Female wage labour, predominantly (88%) casual to begin with, has also increased reaching 92% in 1983 (Table 4).

Table 4 : Composition of workers (main and marginal) according to usual status by category of employment

(Percentages)

	1972-73 M	1972-73 F	1977-78 M	1977-78 F	1983 M	1983 F
Self-employment	65.9	64.5	62.8	62.1	60.4	62.2
Regular wage/ salaried employment	12.1	4.1	10.6	2.8	10.8	3.1
Casual wage labour	22.0	31.4	26.7	35.1	28.8	34.7
Total	100	100	100	100	100	100

GOI, NSS (1985) : 12

It is also possible to get a rough idea of the trends in employment in terms of person days of work: Between 1972-73 and 1977-78, total employment of persons between the ages of 15 and 59 years is estimated to have risen by only 2.3% (from 51.6 billion person days to 52.8 billion person days) - male employment rising by some 7% and female employment falling by about 9%. On the other hand, based on estimates for population aged 5 or more years, total employment, as well as that of males and females taken separately, seems to have remained at the same level as in 1977-78. (Table 5) However the change between 1977-78 and 1983 should be interpreted with caution because (a) the 1983 estimates are based on data for only 2 sub rounds (covering 6 months) while 1977-78 estimates relate to the full year; (b) the rise in rural population between 1977-78 and 1983 on the basis of NSS estimates seems to be substantially below the rate shown by the census.

The pattern of rural employment shows a significant and sustained tendency to diversification: The percentage of rural workers (in terms of their usual status) reporting to be employed in agriculture and related activities has

Table 5 : Estimated total employment by sex and sector India 1972-73 to 1983

(10^9 person days)

	1972-73 1/			1977-78			1983 4/		
	M	F	T	M	F	T	M	F	T
Agriculture	27.6	12.7	40.3	29.7	12.3	42. 2/			
				35.4	14.4	49.8 3/	33.2	13.6	46.8
Non-agriculture	8.2	3.1	11.3	8.5	2.3	10.8 2/			
				9.9	2.9	12.8 3/	12.1	3.6	15.7
Total	35.8	15.8	51.6	38.2	14.6	52.8 2/			
				45.3	17.3	62.6 3/	45.4	17.2	62.5

1/ Sarvekshana January 1980 (relates to workers in age group 15-59. The concept of workers corresponds to main+marginal workers)

2/ April 1979 (relates to main workers in age group 15-59)

3/ July-Oct. 1981 537-538 relates to main workers aged 5 years or more

4/ GOI, NSS (1985) relates to workers (main+marginal) aged 5+ years. Based on estimates for January to June 1983

fallen among both males and females, the fall among males (from 83.2% in 1972-73 to 76.8% in 1983) being more pronounced than among females. The increase in the share of non-agricultural sectors is distributed widely among different categories of non-agricultural activity, though the gain in construction, transport trade and services seems to be relatively more than in manufacturing. (Table 6) We do not have as detailed sectoral distribution of person-days

Table 6 : Sectoral distribution of main and marginal workers (according to usual status) 1972-3 to 1983

(Percentages)

	1972-73 M	1972-73 F	1977-78 M	1977-78 F	1983 M	1983 F
Agricultural, hunting, forestry and fishing	83.2	89.7	80.6	88.1	76.8	86.7
Mining and quarrying Manufacturing electricity, gas and water	6.3	4.9	7.1	6.2	8.0	7.2
Construction	1.6	1.0	1.7	0.6	2.6	0.9
Wholesale and retail trade, Transport, storage and communication, financing real estate etc	4.2	1.5	5.5	2.0	6.5	2.1
Community, social and personal services and others	4.7	2.9	5.1	3.0	5.9	3.0
Total	100	100	100	100	100	100

GOI, NSS (1985) : 14

of employment but we can get some idea of the trend in the relative growth of agricultural and non-agricultural employment from Table 3. This gives a slightly different picture in that the share of non-agricultural sector in total employment fell between 1972-73 and 1977-78 (the fall being quite pronounced among females), but had risen substantially thereafter especially among males (22% to 27%). Indications are that the share of non-agricultural sector in total employment (person days) in 1983 is significantly higher than in 1972-73.

Regional Variations

There are large regional variations in practically every facet of labour utilisation. Salient features of these variations based on 1977-8 data can be seen from Table 7. The overall labour force participation rate (in terms of usual status) for males varies from 55% in Kerala to over 70% in Andhra Pradesh; and for females from 13-14% in Assam to 54% in Rajasthan. In terms of current daily status, the participation rate are generally smaller, and the range of variation much larger. (These statistics are not presented in Table 7). (2) The extent of open involuntary unemployment (in terms of CDS) ranges from a low 2 per cent of labour force in MP to nearly a third in Kerala. (3) Wage employment as a proportion of total rural employment, which is less than 10% in Rajasthan and Jammu and Kashmir, exceeds 40% in Kerala, Tamil Nadu, Orissa and West Bengal. Wage employment is largely in the form of casual labour in most states, but in a few - notably Punjab, Haryana and Assam - the major part of it is accounted by regular employment. (4) The share of non-agricultural activities in total employment ranges from barely 12% in MP, to nearly 30% in West Bengal and an exceptional 49% in Kerala. (5) The quantum of employment in agriculture relative to the area sown also shows large variations.

There are also significant differences between states in terms of the direction and rate of change in the pattern of labour use over time. Table 8, which summarises the available data for three points of time over the last decade, shows :

Table 7 : Estimated employment* and its components in rural areas by States 1977-8

State	Total employment 1/	Employment in Agriculture Total Total 1/	per ha 2/ NSA	(3) as % of 2	Wage Labour Total 1/	(6) as % of 2	Casual labour as % of wage labour 3/
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Andhra Pradesh	5.96	4.58	420	76.8	2.5	35.6	64.6
Assam	1.60	1.35	499	84.5	0.69	33.2	49.0
Bihar	6.19	5.03	585	81.2	2.43	39.1	77.5
Gujarat	2.96	2.53	266	85.3	0.95	28.3	74.3
Haryana	1.03	0.80	215	77.7	0.24	15.4	44.2
J & K	0.48	0.36	414	74.2	0.09	5.0	40.4
Karnataka	3.48	2.97	280	85.4	1.39	37.5	75.5
Kerala	1.84	0.94	428	51.2	0.87	42.2	57.1
Madhya Pradesh	6.02	5.25	281	87.4	1.81	27.2	68.5
Maharashtra	5.96	4.79	262	80.3	2.63	39.7	55.6
Orissa	2.70	2.14	356	79.3	1.11	40.8	68.4
Punjab	1.38	1.08	239	78.3	0.43	25.0	45.5
Rajasthan	3.72	3.18	209	75.4	0.48	7.5	57.7
Tamil Nadu	4.40	3.18	506	72.3	1.51	42.3	63.1
UP	10.25	8.30	450	81.0	1.85	15.2	61.7
W.Bengal	4.07	2.91	452	71.4	1.83	42.3	64.8

* Relate to main workers among males and females aged 5 years or more

1/ 10^9 days per annum

2/ person-days

3/ males, current daily status

Source : Computed from NSS estimates for the 32nd round, Sarvekshana April-June 1981.

(1) Between 1972 and 1977 employment grew at a slower pace than rural population in all but 2 States. This was also the case in several States during the subsequent 5 years, but in a majority of them, employment growth kept pace with or even exceeded population growth. Overall, in Andhra Pradesh, Bihar, Maharashtra, Rajasthan and Tamil Nadu employment growth seems to have persistently fallen short of population growth over the period, the gap being particularly pronounced in Tamil Nadu.

(2) In a majority of cases unemployment rates fell between 1972 and 1977 but in the subsequent 6 years, it shows a rise in a majority of cases. Only Tamil Nadu shows a persistent rise in umemployment rate in both periods - the 1983 level being 60% higher than in 1972. A few States (AP, Bihar, MP) have recorded a progressive fall.

(3) The share of non-agricultural employment rose in a majority of States - the rise being particularly marked in Haryana, Punjab, Jammu & Kashmir, Karnataka, Tamil Nadu and West Bengal.

(4) The incidence of wage labour shows a progressive rise in a majority of States (11 out of 16) - the rise in the first half of the period being in general more pronounced than in the latter part. Interestingly there are several cases where the incidence of wage labour has remained stable (Kerala) or even declined (Maharashtra).

In what follows we intend to explore further the factors underlying the inter-State variations in respect of the labour use in agriculture and the importance of non-agricultural employment. The focus will be primarily on variations at a point of time, but to the extent possible we will also examine the differences in respect of direction and magnitudes of changes over time.

Table 8 : Changes in selected aspects of rural male employment in major States, 1972 to 1983

	Employment 1/			Unemployment 1/			Non-agricultural employment 2/			Wage labour 3/		
	1972/3	1977/8	1983	1972/3	1977/8	1983	1972/3	1977/8	1983	1972/3	1977/8	1983
	1	2	3	4	5	6	7	8	9	10	11	12
Andhra Pradesh	63.5	61.8	60.4	6.9	5.7	5.6	23.5	25.3 24.1	23.9	40.0	45.8	46.6
Assam	55.7	52.0	53.6	1.5	0.8	1.9	18.5	9.4 15.1	21.9	23.8	32.3	35.9
Bihar	55.7	53.9	52.9	5.7	5.7	4.2	20.2	18.9 19.3	22.2	39.5	40.9	42.8
Gujarat	57.3	55.6	55.6	3.5	4.5	3.0	21.4	18.3 17.5	22.4	34.4	37.2	40.4
Haryana	56.5	52.4	55.1	2.2	4.0	3.4	20.6	26.0 23.5	26.8	24.0	28.2	30.0
Jammu & Kashmir	55.5	56.4	50.5	5.2	4.9	8.4	19.4	26.6 28.7	35.8	9.4	20.3	26.8
Karnataka	59.2	53.4	58.4	4.6	4.5	4.7	20.5	19.2 18.6	28.3	37.8	41.8	41.5
Kerala	41.1	38.4	40.6	12.8	13.7	13.4	50.3	49.5 47.8	47.9	54.3	53.8	54.5
Madhya Pradesh	61.5	59.7	60.7	2.2	1.9	1.6	12.5	13.4 13.8	16.6	27.3	31.0	33.7
Maharashtra	58.4	58.2	56.0	5.6	3.4	4.0	34.8	24.0 23.9	29.0	53.5	48.7	47.4
Orissa	58.3	55.8	57.5	6.3	4.5	5.1	22.4	20.6 19.6	28.2	39.9	45.6	43.7

Contd. ...

	1	2	3	4	5	6	7	8	9	10	11	12
Punjab	60.8	58.6	59.4	2.9	2.9	4.1	19.9	25.2				
								23.0	26.8	30.7	36.0	33.6
Rajasthan	64.2	60.5	57.1	3.2	2.6	3.1	21.7	27.3				
								19.7	24.2	10.2	17.1	20.5
Tamil Nadu	61.6	57.5	52.7	7.2	8.4	12.0	24.9	31.5				
								30.1	39.0	42.4	48.4	54.2
Uttar Pradesh	58.7	55.7	56.4	1.9	2.5	2.2	20.4	21.5				
								20.7	24.4	21.6	24.4	24.1
West Bengal	52.4	54.5	50.7	7.2	5.7	8.8	25.9	26.7				
								25.2	33.2	48.1	49.0	50.4

1/ GOI, NSS (1985) : Key Results of the last 3 Quinquennial NSS enquiries on Employment and Unemployment Report No.315 (Delhi mimeo) figures refer to percentage of population aged 5 years and more in terms of current daily status during January-June of each year.

2/ The top row, against each state gives percentage non-agricultural to total employment for males in the age group 15-59 years. The bottom row gives the percentage for males aged 5+ years. All figures refer to CDS and are from Sarvekshana January 1980 (for 1972-73) Sarvekshana April 1979 for 1977-78 (15-59), Sarvekshana Jan-April 1981 for 1977-8(5+ years) and GOI NSS (1985) Report No.315 for 1983.

3/ Computed from Sarvekshana Oct. 1977 (for 1972-73); Jan.-April 1981 (for 1977-8), and Report No.305 of NSS for 1983.

<u>Note:</u> It should be noted that the 1972-73 figures roughly correspond to the category of Main <u>plus</u> marginal workers introduced in 1977-78; The figures for 1977-78 in respect of 15-59 years relates to main workers only; that for 5+ years in 1977-78 and 1983 relate to main + marginal workers.

II

Labour use in Agriculture

The NSS estimates of agricultural employment imply that in 1977-8 on the average 355 days of human labour (of all ages and sex) were used per hectare of net cultivated area and close to 300 days per hectare of gross cropped area. At first sight this seems quite out of line with estimates derived from other surveys, notably the Farm Management Surveys (FMS) conducted during the 1950's and the 1960's. The FMS data, covering some 20-25 districts, give a figure varying from 55 mandays per hectare of gross crop area to a maximum of 190 days.

However it needs to be noted that the FMS got information from the farmers regarding the quantum of labour used in specified operations connected with crop production and animal husbandry. The NSS on the other hand asked the sample workers as to the kind of work they did and the amount of time they spent on it. The FMS listing of operations is not exhaustive of all activities related to crop production there being ambiguities concerning post-harvest operations and the notion of time spent on a particular operation. (For instance how is travel time between job to be treated?) Their coverage of animal husbandry is incomplete in that they provide estimates only for maintenance of work animals. There can also be differences between the perception of the employers and the workers in reckoning "working time". In general the NSS would seem to be more comprehensive in its coverage of activities and may be expected to give somewhat higher figures of labour input than the FMS type of enquiry.

A second factor is that the estimates based on FMS cited above are in terms of standard mandays in order to allow for differences in the quantum (and quality) of

labour effectively put in by workers of different ages and sex. It is conventional to postulate that females and children effectively do only a fraction of the work done by adult males. NSS estimates do not make any adjustment for age - sex differences in the quantum of work per unit of time. For both these reasons, it is not surprising that the NSS estimate of labour input should be higher than the estimates from FMS. We will be using both sets of data in the subsequent discussion for both show large variations in labour intensity of agriculture across regions.

Table 9 presents state-wise estimate of total labour input into agriculture (and related activities) per unit of land in 1977-8 along with data on related characteristics having a bearing on labour use. Table 10 gives similar data for selected districts from different parts of the country on the basis of the FMS.[1].

As noted earlier the average labour input per hectare of net sown area according to NSS estimates ranges from around 210 person-days in Rajasthan/Haryana to nearly 600 days in Bihar. The FMS data which relate to districts dispersed all over the country show the labour input for crop production above to vary from less than 50 standardised mandays per hectare of net sown area in Ahmednagar to 200 days in Surat/Bulsar (Table 10) Including labour used for maintenance of draught animals raises the figure by around 10 per cent, but does not significantly affect the extent of variations in labour intensity of agriculture.

1/ Note that the estimates relate to different periods for different districts. In general they represent 3 year averages. These and other questions concerning concepts and coverage of data are discussed in Vaidyanathan (1978)

Table 9 : Labour use in Agriculture and related characteristics by major States, 1977/78

	HLD/ NSA	Average rainfall	IA/NSA	IAW/IA	Tractors per 000ha	Wage labour/Total labour in Agriculture	Cropping intensity	Foodgrain yield per/ha	% area labour intensive crops	Nutrients per/ha nsa
AP	420	90	32	21	1.63	39	1.15	1.43	31.9	47.8
Assam	499	210	21	neg	0.76	28	1.24	0.97	19.7	2.2
Bihar	585	126	35	38	1.69	37	1.35	0.87	19.9	20.9
Gujarat	266	87	18	78	2.66	27	1.09	1.07	3.1	30.4
Haryana	215	61	52	41	13.97	16	1.49	1.39	10.4	51.8
J & K	414	183	42	1	1.96	6	1.37	1.53	26.7	16.8
Karnataka	280	84	14	26	1.29	34	1.08	0.98	9.4	26.3
Kerala	428	281	10	18	1.1	37	1.32	1.54	11.3	35.4
MP	281	114	12	40	1.15	26	1.14	0.72	4.3	8.5
Maharashtra	262	87	10	58	1.27	38	1.09	0.74	4.2	19.7
Orissa	356	145	19	9	0.43	38	1.32	0.91	16.8	10.7
Punjab	239	59	78	57	21.75	25	1.53	1.94	15.4	108.6
Rajasthan	209	50	19	56	2.19	8	1.12	0.58	0.1	7.4
Tamil Nadu	506	99	46	34	2.03	38	1.23	1.52	37.4	67.8
UP	450	104	51	58	4.58	15	1.34	1.19	13.0	49.3
W.Bengal	452	188	27	1	0.48	41	1.27	1.07	19.7	27.8

Table 10 : Basic data relating to total crop production and associated variables in selected Districts

District	Survey period	Value of out-put in Rs.	% of area irri-gated	% of irri-gated area under wells	% of area under paddy and sugar-cane	Human labour in days (HLD)	Bullock labour in days (BLD)	Mec-hani-cal power in HP	Cost ratio of HLD/BLD	Hired labour as % of HLD	crop-ping inte-nsity	Total rain-fall in mms	Rainfall in June-Sep. as % of total rainfall
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Ahmednagar	1954-56	265	18.5	28.6	1.0	44.3	19.2	0.014	0.81	32	104.8	574	77
Nasik	1954-56	299	12.8	26.0	0.2	56.1	25.4	0.017	0.77	29	101.8	1059	77
Pali	1962-64	303	24.0	54.2	0.1	65.7	22.3	0.016	0.39	na	102.4	369	96
SuratBulsar	1966-68	817	18.3	23.0	23.5	168.5	11.2	0.041	0.10	60	118.0	2906	99
Amritsar/ Ferozepur	1954-56	838	74.0	54.0	1.1	51.0	22.1	0.080	0.51	27	129.0	693	86
Sambalpur	1957-59	894	10.4	24.0	85.5	106.7	30.0	0.004	0.60	42	97.0	1300	92
Cuddappah	1967-69	1075	35.4	48.0	18.8	85.3	19.5	0.088	0.49	68	93.0	697	49
24-Parganas	1954-56	1137	2.0	00.1	81.0	112.0	17.8	0.006	0.78	33	105.0	1490	75
Meerut/ Muzaffar-nagar	1954-56	1153	72.9	24.7	23.5	93.2	29.6	0.031	0.23	32	134.4	1105	80
Cuttack	1967-69	1210	50.6	11.5	73.7	101.2	14.2	0.003	1.07	40	140.0	1401	82
Hooghly	1954-56	1299	25.3	47.4	64.0	146.6	20.0	0.021	1.02	42	106.0	1420	75
W.Godavari (Paddy zone)	1957-59	1371	75.5	02.8	70.5	103.0	15.7	0.003	0.24	79	156.0	1195	63
Deoria	1965-68	1551	30.1	97.8	29.8	100.9	24.9	.064	0.28	41	128.5	1022	77

(Contd. ...)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Ferozepur	1967-69	1622	87.0	51.7	4.9	60.0	13.5	0.125	0.46	49	129.0	327	90
Coimbatore	1970-72	1743	50.0	42.0	16.0	93.4	9.1	0.299	0.33	85	143.0	773	28
Thanjavur	1967-69	1818	91.0	1.3	82.6	118.8	24.1	0.030	0.97	75	151.0	1229	30
W.Godavari (Tobacco Zone)	1957-59	1871	19.9	37.7	25.7	145.0	16.1	0.003	0.33	78	119.0	1092	66
Muzaffa-nagar	1966-68	2006	92.0	38.6	32.3	73.2	19.1	0.142	0.21	40	139.0	860	87

Note : 1. Unless otherwise indicated, all figures are three-year averages per hectare of gross cropped area.

2. Output is evaluated uniformly at all-India average prices for individual crops in the period 1970-72.

3. HLD = Human labour days; BLD = Bullock pair days; HP = Horse power equivalent of engines; CI = Cropping intensity.

Source : Vaidyanathan (1978)

The existence of large variations in labour intensity of agriculture across Asian countries, and the possible reasons therefor were examined by Ishikawa in his pioneering work published in 1967. The problem was further explored, this time in a more detailed way and with greater emphasis on intra-country variations, in a series of studies under the auspices of the ILO-ARTEP. This series included three studies relating to India - one (Alagh , et al, 1978) dealing with inter-district variations in labour intensity defined in terms of the stock of male labour relative to cultivated land; a second (Bardhan 1978) focussing on inter-farm variations in input in selected districts; and the third (Vaidyanathan * labour/days per unit area across selected districts and across crops and operations. Our focus here is on inter-State and inter-district variations in total labour input into agriculture per unit area and the reasons therefor.

Ishikawa (1967, 1978) it may be recalled, sought to unravel the role of technological and institutional factors affecting labour intensity : He distinguished between land augmenting technological change which raises the output per unit of land and thereby facilitates greater use of labour and changes (typically associated with mechanisation of farm operations) leading to a saving in the amount of human labour needed for cultivation. He argued that in the initial stages of development, technical change of the former variety is more prominent and results in a progressive rise in labour input per unit area. At a more advanced stage the influence of labour saving technical changes becomes more important, leading eventually to a decline in labour intensity of agriculture. He saw irrigation as the crucial element-or the "leading input" as he called it - of land augmenting technical change in as much as it is a precondition for other land augmenting changes (such as higher cropping intensity and more intensive use of fertilizer) to take root.

* 1978) seeking to explain variations in the number of labour.

Among the institutional factors Ishikawa stressed were the size of holding, the incidence of tenancy and the working of the market for inputs and outputs. That there is a marked inverse relation between labour intensity of cultivation and size of holding has been noted much earlier and different explanations offered. (Sen 1962, Srinivasan 1971). Ishikawa argued that in the absence of outside opportunities, involuntary unemployment was likely to be more [illegible] under "market economy arrangement" than under community type arrangements (characteristic of Japan in earlier times). Feudal landlords with monopsonistic or ologopsonistic power with respect to labour is recognised as a third type of institutional arrangement with distinctive consequences for labour intensity. Where farming is carried on by cultivator families, he argued, if land lease and/or labour market were sufficiently competitive and the supply of land for rent/demand for wage labour are reasonably elastic, there need not be much of an employment problem. If these conditions are not met, "disguised unemployment is likely to emerge under market economy arrangements though it can be avoided to the extent that community arrangements for providing employment to all members are in operation in some form" (Ishikawa, 1978,: 89-91).

Bardhan's empirical analysis of the variation in labour intensity across farms in Bengal also emphasises differences in technology and institutions - irrigation, multiple cropping, fertilisers and HYV are the major elements of technology considered in his analysis; among institutional factors average farm size, percentage of area leased in, bargaining power of labourers and the wage rate for hired labour are prominent. (Bardhan 1978).

Our data set which relates to 16 states and 18 districts do not permit a detailed analysis of the impact of institutional factors, partly for the reason that relevant information is not available and partly because the observations

are far too few. We will therefore focus here primarily on the role of technological and environmental factors in explaining the inter-regional variations in labour intensity of agriculture, with some observations on the changes in labour intensity in recent years. Our analysis suggests that while technological factors are important, differences in agro-climatic environment are a significant factor influencing the productivity of land and hence the intensity of labour use.

Let us begin with a relatively simple question namely; whether the level of labour input per unit area bears any systematic relation to the productivity per unit area. Both the state cross-section and the district cross-section show that there is a significant positive correlation between the two. That is states/districts where the output per unit of gross cropped area is high tend to use a larger input of human labour per unit of gross area. Data for different size class of holdings in a few selected districts - the choice being determined by availability of data - also show in most cases a positive association between the two variables but the correlation is statistically significant only in 9 out of 13 cases. (Table 11) In three districts labour input per unit area tends to fall as output per unit area rises, the tendency being significant in all cases. The elasticity of labour input relative to productivity per unit of cropped area - taking only cases where the coefficient of association is significantly different from zero - ranges from - 0.5 to nearly +1.1, the majority lying in the range .75 to 1.0. But the small number of observations available in this data set and the fact that they relate to group averages makes them rather unreliable basis for a confident inference. This will have to wait the analysis of farm level data. In the rest of this section, we will be concerned with only the variations in the averages across states and the selected districts.

Table 11 : Elasticity of labour intensity in crop production with reference to output per unit area in selected districts.

District	Elasticity	No. of observation	Significance of Elasticity Coefficient
Ahmednagar	.995	8	S
Surat-Bulsar	-.347	5	S
W.Godavari(paddy zone)	.770	8	S
Meerut/ Muzaffarnagar	.493	5	S
Nasik	.945	8	S
Sambalpur	.813	5	S
Raipur	1.093	5	S
Pali	.598	8	S
Muzaffanagar	.196	5	NS
Thanjavur	-.243	5	S
Deoria	.245	4	NS
Cuttack	.825	5	S
Ferozepur	-.514	5	S
Cuddappah	.105	5	NS
Amritsar/ Ferozepur	.697	5	NS
Coimbatore	.813	5	S

Estimated on the basis of mean values of output and labour input per unit gross cropped area for different size class of farms as reported in the various Farm Management Surveys.

The estimating equation is log (HLD/GCA) = a + log(output/GCA)

It is useful to start with proximate factors influencing the overall labour intensity of cultivation: Variations in labour per cropped hectare must be seen as the combined effect of variations across space/farms in the quantum of labour used to raise each individual crop, and in the proportion of area allocated to different crops. The latter, which reflects differences in crop pattern, is important particularly in the Indian context because (a) wide variety of crops are raised and (b) their labour requirements vary widely. It is therefore reasonable to expect that, other things being equal, a region/farm where the crop yields are higher will tend to use more labour; and that where labour intensive crops are more important overall labour intensity is likely to be higher. One can think of ways of constructing indices to capture the pure yield differences and the pure crop pattern differences across the regions/farms as the case may be, but we have not attempted it in the present study. Instead we have used the overall yield per hectare of cropped area[1] and the proportion of area devoted to labour intensive crops as approximation of the two factors.[2] But for any given level of productivity and crop pattern, the extent of

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1/ In the case of State cross-section, since relevant information was not accessible, we have used foodgrain yield/ha.

2/ The proportion of area devoted to paddy and sugarcane has been taken as the index in this study. Both are known to be far more labour intensive than most other crops. One could easily identify several other high labour intensity crops (tobacco, vegetables, chillies, onions etc.) but their importance in terms of percentage of area allocated is likely to be negligible at the state level.

mechanisation of cultivation operations could make a significant difference to the labour intensity. If we were to explain variation in labour input per unit of cultivated land (as distinct from cropped area) it would be necessary to bring in besides the above three factors, differences in cropping intensity as well. The relation may be written thus

$$HLD/GCA = f(O/GCA, \%LIC, TP/na)$$

$$HLD/NSA = \frac{HLD}{GCA} \times \frac{GCA}{NSA}$$

where HLD = human labour days ; O = output
GCA = gross crop area ; TP = Tractor power
%LIC = percentage of GCA devoted to labour intensive crops

The above relations were estimated with a linear multiple regression for both the inter-state and inter-district cross section.

Coefficients of multiple regression of labour intensity of agriculture (HLD/GCA) against selected variables

	O/GCA	%LIC	TP/HA	$\bar{R}^2$
Inter-state cross-section	-17.6 (-.273)	5.611 (3.068)	-7.683 (-2.193)	.67
Inter district	.018 (1.201)	.446 (1.641)	-99.44 (-.775)	.22

The inter-state cross section corroborates that the proportion of area devoted to labour intensive crops has a strong positive relation to overall labour intensity of agriculture, while tractorisation has a depressing effect on labour absorption. The output per gross cropped acre by itself does not seem to have significant bearing on labour input per unit of cropped area. In the inter-district cross-section, somewhat surprisingly, none of the three factors seem to have a significant association with labour intensity, though the signs of the coefficients are in the expected direction.

A different way of approaching the problem and one which has the merit of focussing on the factors underlying variations in cropping intensity, yield and crop pattern would be to relate the differences in labour intensity to differences in respect of agro-climatic environment and technology, keeping a distinction between those elements of technology which are labour-augmenting and those which tend to displace labour. Much of the available analysis of labour use in agriculture focusses on the effect of technology. There are numerous studies on the effect of **particular** types of technology (irrigation, HYV, mechanisation) on labour intensity. (Mehra 1976, Bartsch 1977).1/ There is general agreement that the elements of bio-chemical technology (like irrigation, HYV, fertilisers) are all land augmenting and therefore conducive to absorption of more labour. But there is difference of opinion on whether mechanisation of operations other than irrigation are, on balance, labour absorbing or labour saving. Some people (including Ishikawa) hold that mechanisation by increasing speed of

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1/ For a comprehensive review of the literature see Rakesh Basant (1985).

operations makes it possible to complete timely sowings on a larger area and to raise intensity of cropping abobe the levels feasible with manual or animal - drawn equipment. Both these being labour absorbing may more than compensate for the reduction of labour use in the operation which is mechanised. The weight of evidence in India (Agarwal 1980, Binswanger 1978) however, suggests that mechanisation is distinctly labour saving and we will work on that hypothesis.

Irrigation, as Ishikawa so strongly emphasised, is in many ways the crucial element of bio-chemical technology: The scope for using other inputs (notably HYV and fertilisers) and their productivity depends critically on the availability of soil moisture and the timeliness and assurance of its supply. And irrigation is supposed to make an improvement over rainfed cultivation in some or all these respects, besides making a significant difference to crop pattern. But quality of irrigation varies and the proportion of area irrigated, which is conventionally used as the irrigation index, is not sufficiently refined to capture differences in quality of irrigation. In so far as groundwater irrigation is superior to surface irrigation in terms of the above criteria, the ratio of area irrigated by wells to total irrigated area could be used as an index of irrigation quality. We will also do the same, but it must be noted that this is still not wholly satisfactory in as much as it does not capture differences in the quality of surface irrigation (in terms of quantum and assurance of water supply) or of differences in the extent of conjunctive use of surface and ground water. The extent of area receiving irrigation is also not a satisfactory index of soil moisture. Part of the reason is that the area measure fails to discriminate between wide differences in the quantum, timing and assurance of water supplies.

But more importantly, since soil receives moisture both from irrigation and rainfall, the effect of the former on cropping intensity crop pattern and productivity depends significantly on the quantum and seasonal distribution of rainfall. (For a more detailed discussion see Vaidyanathan, 1985). Ideally we need to have a measure of the soil moisture status in different seasons reflecting the combined effect of rainfall and irrigation. Since this is not possible - essentially because we have no data on the volume of water delivered from different irrigation sources by season or of the irrigation efficiency - we have to make do with the area measure of irrigation but in conjunction with information on rainfall.

In so far as the level of use and productivity of other bio-chemical inputs (especially HYV and fertilisers) are a function of soil moisture, we need not take explicit account of the latter. The complementarity between soil moisture and the level of other bio-chemical inputs and their productivity, however, is not strict: Variations in these respects can and do occur within any given moisture regime for a variety of other reasons e.g. soil conditions, knowledge of farmers, relative prices. Therefore there is some point - subject to data availability - to including fertiliser inputs proportion of area under HYV. % of area treated against pests and diesase as independent factors affecting productivity and hence labour use.

The other major technological deteriminant of labour use given bio-chemical inputs, is the degree of mechanisation of farm operations (other than irrigation, which is clearly labour augmenting and incorporated in the irrigation index). The effect of mechanisation of particular operations on overall cropping intensity or productivity can not be settled at the macro level. We can only see whether the degree

of overall mechanisation (excluding irrigation) has, given the bio-chemical inputs, a net positive or negative association with labour intensity. We use the total horsepower of the tractor stock as the index of mechanisation.

To recapitulate

$$HLD/NSA = \frac{HLD}{GCA} \cdot \frac{GCA}{NSA}$$

$$HLD/GCA = f\ (\ O/GCA\ ,\ \%\ LIC,\ TP/NSA)$$

since $\frac{GCA}{NSA} = f_1\ (NIA/NSA, \frac{IAW}{IA}, TR, RJS)$

$$O/GCA = f_2\ (\ \frac{GIA}{GCA},\ F\ ,\ HYV,\ \ldots)$$

$$\%LIC = f_3\ (\ \frac{NIA}{NSA},\ \frac{IAW}{IA},\ TR\ ,\ RJS)$$

we may view $\frac{HLD}{NSA}$ as a function of $NIA/NSA, \frac{IAW}{IA}$, TR, RJS, TP/NSA, F and HYV.

IAW - Irrigated area by wells

TR - Total Rainfall

RJS - % rainfall in June-Sept.

In the present exercise we have not considered F (because it tends to be highly correlated with irrigation and crop pattern) and HYV (because reliable data are not available).

A linear multiple regression analysis of the inter-state cross-section shows that other things being given, regions with higher total rainfall tend to have a higher labour intensity; the higher the proportion of irrigated area the higher the labour intensity; and the greater the extent of tractor use the less is the labour intensity. All these relations are statistically significant. There is but a weak positive association between the proportion of irrigated area served by wells and labour intensity. The analysis of inter-district cross-section confirms that there is a

significant positive association between labour intensity on the one hand and total rainfall, and (somewhat less strongly) the extent of irrigation. It also shows that the greater the seasonal concentration of rainfall, the lower the labour intensity. Mechanisation however does not have a significant relation with the labour intensity.

Coefficients of multiple regression of labour intensity of agriculture (HLD/NSA) on selected variables

	TR	%RJS	%IA	IAW/IA	TP/NSA	R^2
Inter-state	0.965 (2.609)		6.902 (4.726)	.454 (.465)	-23.14 (4.58)	.723
Inter-district	.073 (5.603)	-1.879 (-2.871)	.511 (2.147)	.464 (1.359)	-134.98 (-1.199)	.67

(Figures in brackets are T values)

Our data confirm that the overall irrigation ratio does indeed have a significant influence on labour intensity of agriculture, but it can explain only a small proportion of the spatial variations in the latter. Climatic variables - and specifically rainfall and its seasonal distribution turn out to be important factors.

As mentioned earlier we do not have sufficient information or large enough body of observations to explore the role of institutional factors in determining labour intensity of agriculture. However the data permit us to see whether there is any systematic relation between labour intensity and the extent of dependence on wage labour - the latter being an indicator of the relative roles of cultivation using wholly or mostly family labour and cultivation depending

largely or wholly on wage labour. Taking the cue from Sen's explanation for the inverse relation between farm size and labour intensity[1/] we would expect that the higher the dependence on wage labour, the lower, ceteris paribus, will be the labour intensity. But, as the estimates of multiple regression given below show, other things being the same, states/districts with a higher proportion of wage labour in total labour input into agriculture tend to have <u>higher</u> total labour input per unit of land, the relation is statistically significant in the case of the State cross-section but not in the data relating to selected districts. A more disaggregated analysis of data at least at the regional level - which should be possible if the regional level tabulations of NSS data were available - would be useful to test the robustness of this as well as other relations concerning labour intensity.

Multiple regression of labour intensity of agriculture on selected variables

	TR	RJS	%IA	TP/ha	HL/AL	$\bar{R}^2$
Inter State	.772 (3.479)		7.115 (6.437)	-22.007 (5.183)	3.117 (2.676)	.829
Inter district	.062 (4.616)	-.358 (.732)	.483 (2.16)	-53.51 (.558)	.698 (1.738)	.693

(Figures in brackets are T values)

1/ that the family labour based farms interested in maximising total income carries labour use much further than a farmer depending on wage labour would, because the latter is interested in maximising his net income after meeting wage costs.

Variations over time

The picture regarding changes in labour intensity is rather confused: We saw earlier that there is in general a positive association between output per hectare and labour input per hectare across farms in a given region, and that the elasticity of labour input relative to output (per unit area) in general exceeds 0.5. But evidence of changes in labour intensity in a given area over time is rather scanty.

Comparable data on productivity of land and quantum of labour input per unit area at different points of time are readily available only for four districts from the Farm Management Surveys. They suggest that labour inputs per hectare has risen at a much slower rate than output per hectare and that in some cases have actually declined (Vaidyanathan 1978, Sinha 1979). Some limited analysis of data from cost of cultivation data also suggest similar trends (Rajagopalan). Cross section data clearly do not give a reliable basis for judging the relation between yield improvement and labour use in a dynamic context.

Alagh and Bhalla have put together some data at the district level and found that the rate of growth of rural male workers tends to be higher in districts with relatively high rates of output growth and argued that this reflects the differential demand for labour associated with differential growth of output. While this association is significant and suggestive, several points need further probing before firm inferences can be drawn: First the comparison is based on averages for only 4 categories of districts grouped according to growth rate of output. Second those experiencing relative stagnation or decline in output do not fit the pattern in that the growth of male worker population in this category is much higher than in low growth districts. Third, the data relate only to male workers, and that too to the

stock of labour power without any allowance for differences in the intensity of its use. Clearly this offers a rich area for further work.

Data on the quantum of labour used in agriculture available from the NSS suggest that for rural India as a whole labour use in 1977-8 was only some 4% higher than in 1972-3 while crop production was at least 20% higher.1/ At the State level, while total agricultural employment generally rose, the rise was well below the growth of output in all cases, except Assam and Kerala; in six states though output rose, labour use in agriculture in 1977/8 was <u>less</u> than in 1972-3. There is no relation between the % change in agricultural employment and % change in output.

Now there are reasons to expect employment/in agriculture to grow slower than output: we have already seen that the elasticity of employment relative to yield per hectare based on the experience of a few districts is substantially below unity and yield increases have been a significant source of growth in recent years. At a more general level, while certain types of labour using technical changes (notably the spread of irrigation and of ground water in particular) have taken place, this may be in some measure counterbalanced by the rapid mechanisation of groundwater irrigation at least in so far as employment in irrigation is concerned. The fact that the ratio of farm yard manure (which is highly labour intensive) to chemical fertilisers (which involves handling smaller volumes of material per unit nutrient) has fallen steeply implies that increase in labour input in fertiliser and manure application would have been much slower than the

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1/ Available estimates for 1983 are incomplete in that they relate only to 2 sub-rounds. Also, as already mentioned the NSS estimate of rural population growth between 1977 and 1983 seems out of line with census data.

growth in the quantum of nutrients applied. And mechanisation of other farm operations (including ploughing, harvesting, threshing and transport) are clearly labour saving.

Table 12 : Estimated change in employment and output in agriculture 1972-73 to 1977-8

	1972-3		1977/78		% change 1977/8 over 1972/3 in	
	Employment 1/ 10^6 PD	Index 2/ of output	Employment 1/ 10^6 PD	Index 2/ of output	Employment	Output
AP	3374	143	3781	188	12	31
Assam	1079	144	1302	146	21	1
Bihar	4139	146	4474	160	8	10
Gujarat	1967	166	2242	352	14	112
Haryana	727	284	641	384	-11	35
Karnataka	2168	194	2363	290	9	49
Kerala	764	185	834	182	9	-1
M.P.	4600	147	4560	176	- 1	20
Maharashtra	3158	88	4106	228	30	159
Orissa	1791	153	1799	179	04	16
Punjab	880	284	865	384	- 2	35
Rajasthan	2656	189	2416	276	- 9	46
Tamil Nadu	3101	236	2693	265	-13	12
UP	7044	160	6618	196	- 6	22
W.Bengal	2244	136	2471	183	10	34

1/ Relates to 15-59 years, males & females

2/ AV Jose (1982)

What the balance of these influences has been in different parts of the country and whether the changes in labour use in agriculture as shown by NSS are a reasonably accurate reflection thereof are questions which we are not in a position to answer definitively. Part of the reason is that there is some basis to believe that the NSS may be under-estimating the real increase in agricultural employment in as much as, in the context of

growing specialisation of activity, the reporting of sectoral distribution of work and workers may be getting more and more discriminating. (See Section 3 for further discussion of this point).

III
Rural non-agricultural Employment

While agriculture is unquestionably the dominant source of employment in rural India, non-agricultural activities are by no means inconsequential: At the time of the 1981 census, nearly a fifth of the rural workforce (main workers) were reported to be employed in non-agricultural pursuits. The National Sample Survey (NSS) estimates that in 1977-8, in terms of their usual status, nearly 20% of male workers and around 12% of female workers in rural India are employed in non-agricultural activities. In terms of mandays of actual work, non-agricultural activities accounted for 22 per cent of total employment in the case of males and one sixth in the case of females.[1] In absolute terms the volume of non-agricultural employment in rural areas accounts for nearly a third of the total non-agricultural employment in the country. A serious study of the determinants of rural non-agricultural employment is therefore in order.

There exists quite large regional variations in ratio of non-agricultural to total employment in rural areas: According to the 1981 census, this ratio (in respect of main workers) ranges from around 12.6% in MP to over

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1/ On the basis of NSS data for 1977-78 about two-fifths of rural non-agricultural employment is in mining and manufacturing (the former being insignificant); approximately a quarter each in (a) trade, transport & communication, and (b) community, social and personal services. About 8% is reported to be in construction.

25% in West Bengal and an exceptional 52% in Kerala. According to NSS (32nd Round) data, the ratio of non-agricultural to total employment in rural areas (in terms of mandays) varied from 12 per cent in MP to 30% in West Bengal and again an exceptional 50% in Kerala. An exploration of the reasons underlying these variations could hopefully give us some basis to judge how far they are amendable to manipulation by policy and through what policies.[1/]

Factors influencing rural non-agricultural employment

Broadly speaking the level of rural employment in non-agricultural activity (relative to the rural labour force) can be viewed as a function of the following factors: (1) the level of rural demand (relative to population) for various non-agricultural goods and services produced locally; (2) the level of extra-local demand-from urban areas in the vicinity as well as from other regions - for rural products (and services) (3) location, scale and technology of activities catering to these demands.

1/ Sankaranarayanan (1980) in an unpublished paper drew attention to the existence of these variations and went on to consider how far these are associated with the prosperity of the rural population and commercialisation of rural economy (measured by monetization of consumption). While he found the former to be relatively non-significant, he noted a positive, and often significant, association between commercialisation and the share of non-agricultural activities (both overall and by major sub-category) in rural employment.

Demand factors: local rural demand

The rural sector's demand for non-agricultural products consists of inputs for agriculture and animal husbandry, manufactured goods for final consumption and/or capital formation, consumer services of various kinds and trading, transport and related services.

Traditional agriculture uses mostly locally produced inputs, a large part of it derived from agriculture and animal husbandry. The few non-agricultural inputs - such as making and repair of implements - were also produced by local artisans (usually under the Jajmani system). With introduction of modern technology - eg., fertilisers, pesticides, and mechanical equipment like pumps and tractors - the dependence on non-local inputs increases greatly. Most of the modern inputs, except perhaps machine repair services, are produced by industries located outside, often far away from the villages where they are used. Consequently, while the growth of agricultural production generally accounts in a more than proportionate increase in the demand, for inputs from non-agricultural input, it does not necessarily lead to an increase in demand for locally made inputs taken as a whole.

The final demand for manufactures and services in a given rural area is in part a function of the level of prosperity of its population, of whom agriculturists are the most important segment. Given that these are highly income elastic demands, it is to be expected that the rural demand for manufactures and services relative to population will be higher in areas where the per capita income of agriculturists is high and/or the distribution of incomes is more uneven. However not all this demand is for goods

and services produced in the village. The relative size of the demand for local vs outside products is in part a function of consumer preferences which in turn may be systematically related to per capita incomes - richer people wanting newer, more exotic products and products of superior quality. The extent to which the consumers are exposed to, and have access to, modern, urban products and life styles - which in turn depends on the extent of linkages with outside markets - could also affect the preferences as between local as against outside manufactures. (Linkages with markets outside the village also affects production and employment in rural areas - via the relative economic advantages of different locations and techniques - on which more later).

The rural demand for personal and community services in a given area - which are mostly locally produced - again seems likely to be a function of the general prosperity of the rural population in that area. However there are certain categories of community services - e.g., public administration, education and modern health services - whose level and location may be determined exogeneously, e.g., by state policy. These have expanded very rapidly in the last 3 decades and there is some evidence that rural employment under this category has become quite sizeable in recent years.1/ The level of state expenditure in rural areas obviously has second round effects on the demand for products of rural non-agricultural sectors and hence non-agricultural employment.

1/ A rough estimate based on the census work force data shows that the number of rural male workers engaged in electricity, communication, public administration and defence, education and health has increased from 2.5 million (2.4% of all rural male workers) in 1961 to 5.3 million (3.9% of male work force) in 1981.

In the case of trade, transport and finance the level of local demand relative to population is related to per capita incomes (of which the volume of production per head is clearly an important determining factor) and the extent to which the local rural economy is commercialised. The larger the output per capita and the proportion of output which is sold outside, the larger will be the volume of trade and trade-related activity. That a high degree of commercialisation in production also implies a greater degree of dependence on market purchases for intermediate and final goods adds to the volume of commercial and transport activity.

Extra local demand

The market for products of rural non-agricultural activity is in many cases clearly confined to the local villages. This is particularly true of trade, transport, and services. But it is not always and necessarily so: Several products of rural industry - eg. earthenware, leather footwear, processed farm produce like sugar and textiles - are sold in neighbouring urban markets and sometimes over a much wider area. Little is known about the extent to which rural industries products are meant for extra-local demand. However if we are considering non-agricultural activity as a whole, and more so if we exclude manufacturing, it may not be unreasonable to assume that the "markets" are mostly local.

It could also happen that some part of the rural workers reporting non-agricultural employment may be employed in nearby urban areas but residing in the village. To this extent a part of the non-agricultural workers

residing in rural areas may in fact be working outside the catering to extra-local demands. How large a component this category is depends on the proximity to urban centres, the size of the urban centres relative to the rural population of the area, the ease of access to transport and the costs of commuting. The larger the nearby towns, shorter the commuting distance and cheaper the cost the larger is likely to be the incidence of this phenomenon. We know little about where and how important this phenomenon is.

Organisation, scale and technology

For any given level of demand, the level of employment could vary depending on what kinds of techniques are being used, and how production is organised. The number of persons employed to process a given volume of say paddy will clearly be much smaller with modern rice mills than with traditional hand pounding. Whether non-agricultural activity is specialised or is an adjunct to agriculture may also make a difference to the employment, at any rate as reported in response to survey type enquiries.

The degree of commercialisation of the rural economy would seem to be a major factor affecting the scale, location and technique used in rural non-agricultural activity. Traditionally village communities were relatively self-sufficient and had an internal division of labour based largely on caste and regulated by the jajmani system. Trade and transport activity was limited, and most of the transport was done by bullock carts or on animals. The level of development of the transport network, as well as the size and density of village settlements would seem to be relevant

in determining the location, organisation and hence labour intensity of non-agricultural activities.

The spread of commercialisation alters the picture in several important respects: First, agricultural production gets more specialised and the extent of trading - and trade related activity - increases. Second, increased exposure to and contact with nearby urban market centres may alter the pattern of rural demand for non-agricultural products in favour of extra-local sources. Third, since commercialisation of agriculture extends the territorial network of exchange, the effective size of the market for non-agricultural goods and services also expands, creating thereby the conditions for greater specialisation, technical change and spatial concentration of non-agricultural production. This process, which one would expect to be rather more pronounced in manufactures, will be further accentuated with improvements in transport (which reduce transport costs). The net effect might well be to increase dependence on non-local sources for meeting demand for non-agricultural goods and services by encouraging a shift in preferences favouring new products from outside and/or extra-local supplies for traditional products. On the other hand, countering these tendencies to displace local non-agricultural activists is the fact that the volume of trade and trade-related activities increases greatly as a result of commercialisation. It is difficult to hazard an a-priori prediction of the balance of these influences on the overall level of non-agricultural employment. We will explore them empirically.

Before doing so, we must note the possibility that greater specialisation, and the differentiation of tasks which it implies, may affect the way people perceive and

report their activity status. For instance, a carpenter or a cobbler who combines cultivation with his craft may not be able to specify the sector of his employment in terms of the categories used by those conducting the census or the sample surveys. To the extent such multiple occupation status is more common in traditional, relatively less commercialised communities, there is a problem of comparing industrial distribution of employment across communities/regions at different levels of commercialisation. This is especially true of the 'usual status' classification of workers; the problem is considerably less serious, but not eliminated, if one ascertains activity-wise time disposition by the week or, better still, the day.

A similar non-comparability of data on the reported sectoral distribution of person days of employment may arise in situations where the incidence of wage labour is significant but both its incidence and forms vary. For instance a permanent farm servant does a wide variety of tasks. Some of it is clearly non-agricultural but in the usual survey they, and their labour time, probably tend to be recorded mostly under agriculture. A casual labourer on the other hand is more likely to differentiate between taks he does if we are considering time disposition. In other words, it is possible that an area with a high level of casual wage labour may report a higher proportion of mandays in non-agricultural activity than another region with comparable incidence of wage labour as a whole but a relatively high incidence of permanent or attached farm servants.

Non-agricultural activity as a residual sector

One other possibility to be considered is that rural workers who cannot get adequate work in agriculture spill over into rural non-agricultural activities so that the latter acts - on the analogy of the "informal sector" in urban areas - as a sponge for the excess labour. Such spill over may not manifest itself in traditional rural communities where family community and patron-client relations are strong. It seems more likely in situation where commercialisation has advanced and the wage labour system has become widespread in as much as both tend to weaken the traditional social mechanisms for taking care of the unemployed/underemployed and increases the pressure on those who cannot find work in agriculture to seek other avenues of employment. And, in terms of the conventional supply-demand analysis of the labour market, if the absorptive capacity of agriculture and of urban areas is limited, the pressure of excess labour supply in rural areas will fall more heavily on rural non-agricultural sector which means that the level of the rural non-agricultural wage rate relative to the agricultural wage should be quite sensitive to the extent of imbalance between labour supply and demand in the rural areas. This imbalance is not easy to measure, but one may perhaps take the rate of rural unemployment as a rough measure of it. In which case, the higher the rate of unemployment, the higher is likely to be the share of non-agricultural sector in total rural employment and the lower the non-agricultural wage relative to that in agriculture.

To recapitulate, we have identified the following factors which seem likely to influence the share of non-

agricultural sectors in total rural employment.

(1) Per capita rural demand for non-agricultural products. This is expected to be a rising function of (a) per capita income of agricultural classes and the degree of inequality in its distribution; (b) the magnitude (and content) of public expenditure in rural areas; and (c) the degree of commercialisation (measured by the proportion of rural produce which is sold in the market). Commercialisation itself is likely to be an increasing function of (a), but depending in addition of the nature of technology used and on the importance of commercial crops.

(2) Extra local demand for rural manufactures and services.

(3) Rural Demand for non-agricultural goods and services produced locally relative to the total rural non-agricultural demand. This seems likely to be inversely related to the degree of commercialisation (and perhaps also per capita income and its distribution) in as much as the latter affects preferences of consumers and induces changes in location, scale and technique of production. This means that the mean income of agricultural, population, inequality in income distribution and commercialisation have both positive and negative effects on aggregate rural demand for non-agricultural products. The net effect on is not easy to predict.

(4) The extent of excess in labour supply relative to the requirement of workers in agriculture and exogenously determined non-agricultural activity.

In attempting to assess the strength of these influences in explaining the observed variations in rural non-agricultural employment, we have to contend with the problem of inadequate data.

Data and their limitations

We have estimates of rural non-agricultural employment from two sources, namely the Population Censuses and the NSS. The latter gives 3 different estimates (based on the concept of usual status, current weekly status and current daily status). While they differ from each other in absolute terms, the relative position of different states/ regions is substantially the same by all measures. On the whole, the NSS estimates, being based on more detailed and precise definitions of relevant categories, are more reliable. But published tabulations are available only upto the state level thereby precluding analysis of variations at a more disaggregated level. Second, among the explanatory factors, no information is available on the magnitude of extra-local demand for rural manufactures/ services even at the national level, let alone regional levels. The same is true of public spending in rural areas.

Third, we have state level estimates of net income from agriculture and allied activities and also of the value of crop production. The estimates for non-crop activities are at best notional. Those relating to crops are derived from measurement of actual output which, though by no means complete or accurate, are far better grounded than other elements. As for distribution, the NSS gives estimates of inequalities in consumption for

the rural population as a whole, but not separately for agricultural classes. Estimates of inequality in asset ownership and landholdings are also available, again for the entire population. The order of inequality in landholdings among those who have some land can be used for capturing the relative inequalities of income among agricultural classes - but clearly this is not entirely satisfactory.

Fourthly, the only available measure of commercialisation we have is the extent of monetisation in consumption. What we need is a measure of the quantum of farm produce sold as a proportion of the total farm production. Even if one were to take the former as a reasonable proxy for the latter, the latest year for which estimates are available (1963-64) is nearly two decades old and may not give a reliable picture of the situation in the seventies. The extent of commercialisation has therefore to be captured indirectly. It seems plausible to suppose commercialisation to be an increasing function of the level of output per head of agricultural population, the inequality in land distribution and the percentage of area under non foodgrains. Though not quite satisfactory - it leaves out the effect of differences in the spread of modern agricultural technique which is intensive in the use of manufactured inputs - this is the best that can be done at present.

Finally since the requisite data for various explanatory variables are available only upto the state level, (and the major states number barely 16), there is a limit to the number of explanatory variables which can be accomodated in the analysis.

Keeping all these in view, we choose the following as the candidate explanatory variables

1) Crop Output per head of agricultural population (CO/AP)
2) The Gini Index of concentration of operational holdings (LR)
3) The proportion of cropped area devoted to non-foodgrain crops (% NFG)
4) The unemployment rate in rural areas (PDUR).

Their relation to the incidence of non-agricultural employment is examined by estimating a linear multiple regression.

The assumption is this CO/AP captures reasonably well the relative position of states in terms of the prosperity of agricultural classes (including both cultivators and labourers) as a whole, and that LR of landholdings captures the differences in inequality in distribution of income. Both CO/AP and LR have also a bearing on commercialisation. We have distinguished between the incidence of non-agricultural employment among males and in the total work force, as well as between workers classified by their usual and current status. In the case of unemployment, the current daily status estimates have been used.

The relevant data are summarised in Tables 13 and 14 the former relates to area 1971 : The incidence of non-agricultural employment is taken from the 1971 census of population and the NSS estimate for 1972-73; The crop output estimates relate to 1969-70, the per capita figures being derived on the basis of the distribution of male workers between agriculture and other activities estimated from the 1971 population census; the inequality of landholdings and percentage of area under NFG relate to 1971. In Table 2, percentage of non-agricultural employment, unemployment rates and share of non-foodgrain crops relate to 1977-78, crop output estimates represent the average for 1975-76 - 1979-80; the LR relates to 1971-72. That the data for all variables in either Table do not relate to the same point of time and that the data are subject to error argues for caution in interpreting the results which can at best be considered tentative.

TABLE : 13 Rural Non-Agricultural Employment & Related Factors by State 1971

	Non-agricultural[1] workers/as % of all workers (NSS)		Non Agriculture[2] workers as % of all workers (Census)		Crop out-[3] put per agricul-tural popu-lation	Mone-[4] tiza-tion of con-sumption	LR of[5] land hold-ings	% are a[6] under non-food grains	Unem-[7] ploy-ment rate
	Total	Male	Total	Male					
Andhra Pradesh	22.1	23.5	20.9	24.4	411	62	.741	35.5	8.4
Assam	18.	18.5	27.3	23.4	462	55	.583	28.5	1.7
Bihar	19.7	20.2	11.4	12.3	221	52	.644	10.1	8.9
Gujarat	19.3	21.4	16.2	18.2	353	65	.682	50.3	5.4
Karnataka	19.4	20.5	20.2	20.5	409	62	.679	33.3	8.1
Kerala	50.1	50.3	45.4	46.6	556	81	.678	68.9	24.5
Madhya Pradesh	10.7	12.5	11.	12.8	360	45	.595	19.4	2.8
Maharashtra	32.4	34.8	14.3	18.2	308	66	.666	30.3	9.1
Orissa	23.8	22.4	16.9	16.2	418	52	.627	14.7	7.7
Punjab & Haryana	23.8	20.3	22.2	21.8	729	52	.754	27.	5.
Rajasthan	17.	21.7	15.4	16.3	297	50	.558	24.	4.1
Tamil Nadu	22	24.9	21.6	23.4	317	73	.719	33.7	10.8
Uttar Pradesh	19.7	20.4	12.9	13.5	370	46	.614	15.2	3.4
West Bengal	28.8	25.9	21.9	21.2	354	59	.643	12.6	9.9

Source: 1 Relates to 1972-73, Sarvakshna, Jan.1979

2 Census of India, 1971

3 Gross crop output 1969-70 (CSO est) ÷ population 1971 ÷ of all male workers engaged in agriculture 1971 CMIE (1975)

4 Relates to 1963-64. Estimates of NSS cited in Sankaranarayanan (1980)

5 Estimates from NSS, relates to 1971-72 - excludes '0' class

6 CSO Statistical-Abstract

7 Person day unemployment rate for rural male, NSS 1972-73

Table:14 Proportion of rural workers employed in non-agricultural activities and related variables, States 1977-78

	Usual Status		% non-agricultural workers Current daily status		Crop output/ head agricultural population	% area under non-food grains	LR of land holdings	Unemployment rate	
	Total	Male	Total	Male				Total	Male
	1	2	3	4	5	6	7	8	9
Andhra Pradesh	17.3	19.7	23.2	24.1	444	30	0.741	11.7	9.0
Assam	14.5	14.5	15.5	15.1	407	23	0.583	1.6	1.6
Bihar	15.9	17.0	18.8	19.3	236	7	0.644	8.6	8.3
Gujarat	12.4	15.7	14.7	17.5	565	56	0.682	6.4	6.5
Haryana	22.6	22.9	22.3	23.5	1141	23	0.682	6.7	7.4
Jammu & Kashmir	22.7	26.0	25.8	28.7	362	10	0.436	6.8	6.6
Karnataka	15.6	16.9	17.7	18.6	493	37	0.679	9.8	8.3
Kerala	43.8	43.4	48.7	47.8	853	70	0.678	34.8	33.4
Madhya Pradesh	8.7	10.8	12.6	13.8	374	19	0.595	2.8	2.5
Maharashtra	14.7	19.6	19.7	23.9	433	26	0.666	7.8	6.2
Orissa	15.3	15.5	20.7	19.6	427	16	0.627	8.7	8.1
Punjab	23.1	23.2	21.7	23.0	1516	29	0.786	5.2	5.9
Rajasthan	13.4	18.0	14.6	19.7	371	29	0.558	2.8	3.2
Tamil Nadu	23.5	26.0	27.6	30.1	579	27	0.719	18.6	17.6
Uttar Pradesh	20.2	29.2	19.0	20.7	423	18	0.614	3.9	4.2
West Bengal	25.8	22.6	28.6	25.2	403	16	0.643	10.3	10.3

1. Data from 32nd round of NSS relates to 1977-78. Ratio of unemployed to working population according to current daily status classification, Sarvekshana, July-Oct. 1982 & January 1984.
2. Value of crop output per capita (average 1975-76 to 1979-80) estimated by Centre for Monitoring the Indian Economy (1985) ÷ % of all male workers employed in agriculture according to the 1971 census (1981 census figures on work force and its sectoral distribution is as yet incomplete). The estimate of crop output covers all cereals, gram, groundnut, rape seed and mustard, cotton, jute, tea, coffee, potato, bananas and sugarcane.
3. CSO, Statistical Abstract, 1980
4. Relates to 1971-72, operational holdings excluding '0' class.

Table 15 : Estimated Coefficients of Linear Multiple Regression of the ratio of non-agricultural to total employment in rural areas and selected Variables

		CO/head	LR	%NFG	PDUR	$\bar{R}^2$
1971 NSS-CDS	M	.0045	-23.125	.107	1.332	.784
		(.423)	(.785)	(1.073)	(4.891)	
	T	.0183	-18.573	-.0092	1.513	.789
		(1.67)	(.774)	(.09)	(5.431)	
1977 NSS-CDS	M	.0061	-26.51	-.0489	1.050	.871
		(2.241)	(- 2.294)	(-.799)	(8.423)	
	T	.0082	-28.482	-.1065	1.138	.906
		(3.272)	(-2.681)	(1.900)	(10.502)	
1971 Census US	M	.0240	-23.048	.2044	.8879	.876
		(3.122)	(1.369)	(2.860)	(4.546)	
	T	.0348	-42.416	.1668	.8983	.792
		(3.396)	(1.892)	(1.752)	(3.453)	
1977 NSS US	M	.0092	-31.705	-.0323	.9059	.862
		(3.525)	(2.869)	(-.552)	(7.596)	
	T	.0126	-35.089	-.091	.9681	.827
		(3.9028)	(2.563)	(1.263)	(6.931)	

(Figures in bracket are T values) CDS - Current daily status Status

US - Usual status

1) Overall the selected explanatory variables account for 80% of the variation in non-agricultural employment. This is true for males as well as for all workers, and whether one takes the usual status of workers or their current status.

2) In all cases, except current status of workers in 1971, the incidence of non-agricultural employment is seen to have a significant positive relation with crop output per head of agricultural population : that is. to say states

with relatively prosperous agricultural population tend to have a high proportion of rural workers in non-agricultural activity.

3) However, other things being given, higher inequality of operational holdings seem to go with lower incidence of non-agricultural employment : This relationship is statistically significant in all cases except the current status measure in 1971.

4) On the basis of NSS data, the percentage of area under non-foodgrain crops has no significant association with non-agricultural employment. But the two variables show a significantly positive relation when we use the 1971 census estimate of rural non-agricultural employment.

5) In all cases, there is a significant positive relation between the rural unemployment rate and the incidence of non-agricultural employment and this association is much stronger than in the case of all other explanatory variables.

Given that we do not have a direct measure of commercialisation, and that the gross crop output is an incomplete and crude measure of net incomes of agricultural classes, caution is warrantedin drawing inferences about the effect of the prosperity of the agricultural classes and the degree of commercialisation on rural non-agricultural employment. Refinements in this respect are contingent on more and better information becoming available. But there can be no doubt about the strong positive association between unemployment rate and non-agricultural employment in rural India. This would seem to give credibility to the notion that non-agricultural activities in rural areas may be acting to some extent as a residual sector absorbing labour which cannot find work in agriculture. If this were so, as we have argued earlier, it must be reflected in systematic variation of non-agricultural wage rates relative to agricultural wage with reference to unemployment. The relavant data on this are summarised in Table16

Table 16: Unemployment and wage rates in rural India

	1974-75			1977-78[3]		
	PDUR[1]	Average daily earnings (in Rs.) of males[2] Agriculture	Average daily earnings (in Rs.) of males[2] Non-Agriculture	PDUR	Average daily earnings (in Rs.) of males Agri-culture	Average daily earnings (in Rs.) of males Non-agri-culture
AP	8.4	2.66	2.80	9.	3.5	4.39
Assam	1.7	4.02	3.29	1.6	5.12	5.42
Bihar	8.9	3.24	3.38	8.3	3.39	4.53
Gujarat	5.4	3.22	3.22	6.5	3.89	5.70
Haryana	*	*	*	7.4	5.75	6.06
Karnataka	8.1	2.87	3.16	8.3	3.04	4.15
Kerala	24.5	5.97	5.48	33.4	6.65	6.72
MP	2.8	2.42	2.47	2.5	2.76	6.79
Maharashtra	9.1	2.64	2.68	6.2	3.15	4.53
Orissa	7.7	2.64	2.50	8.1	3.07	3.75
Punjab	5.**	5.60**	5.10**	5.9	7.08	7.71
Rajasthan	4.1	3.85	3.27	3.2	4.33	5.37
Tamil Nadu	10.8	3.69	3.56	17.6	3.89	4.32
UP	3.4	3.21	3.66	4.2	3.63	5.20
W.Bengal	9.9	3.49	3.27	10.3	3.98	5.37

1/ Relates to 1972-73, Estimates from Sarvekshana

2/ Relates to all agricultural and non-agricultural operations respectively. Estimates from report of the Rural Labour Enquiry

3/ NSS 32nd round estimates, Sarvekshana April-June 1981. Average daily earnings relate to manual work in 'other agricultural operations' and in manual non-agricultural work.

* Included under Punjab.

** Includes Haryana.

A plotting of the data (figure) shows no striking relation between the unemployment rate on the one hand and the non-agricultural wage rate either in absolute terms or relative to agricultural wage. The non-agricultural wage rate is in general higher than agricultural wages in both years for which data are available, the difference being more prominent in 1977-78 than 1974-75. However this may be more a reflection of differences in the coverage of the two estimates. The 1974-75 data relate to overall average daily earnings of all male rural wage labourers in agricultural and non-agricultural work; the 1977-78 estimates relate to average earnings of casual male labourers in manual agricultural operation other than ploughing, sowing, transplanting, weeding and harvesting, and to manual non-agricultural work. It happens that the former is in general lower than the average earnings for labour in "other" agricultural work.

That apart, there seems at first sight no indication of the ratio of non-agriculture to agricultural wage being inversely related to unemployment rate, this relation being implicit in the resudial sector hypothesis. However, there is indication of a more complex pattern. Assam, Punjab and Haryana, with relatively low unemployment and high wage rates, also show very low differences between non-agricultural and agricultural wage rate. Among the remainder, the scatter suggests that in states with relatively high unemployment rates (8^+ % in 1974-75 and 6^+ % in 1977-78) there is a noticeable tendency for the ratio of non-agricultural to agricultural wage rates to narrow as unemployment increases.

Changes Over Time

In the post Independence period, several of the factors which we have identified as having a bearing on rural non-agricultural employment have shown major systematic changes. In the first place, level of crop output relative to agricultural population has increased progressively if slowly; output of non-foodgrain crops has grown nearly as fast as total output; dependence on purchased, non-rural inputs relative to output has increased rapidly from less than 5% in 1960-61 for the country as a whole to 15% in 1980-81; and the extent and quality of transport network linking rural with urban areas has improved. All of this points to increased commercialisation of the agricultural sector. Throughout this period, the proportion of wage labour in the rural work force has risen and the wage labour is getting increasingly casualised.

Growing commercialisation of agriculture must have intensified the process of widening and integration of rural markets for manufactures leading to reorganisation and relocation of traditional rural industry and stimulating technological change. It must also have made it easier for newer products from urban areas to penetrate the rural market and bring about changes in the consumption patterns of the rural areas. That such changes have taken place is apparent to even casual observation though their magnitude and impact remains to be assessed.

The impact of relatively fast growth of rural commerce transport and manufactures on rural non-agricultural employment have been dampened by technological changes which are taking place, partly autonomously and partly as a consequence of the widening of markets. The rapid growth of powerlooms

over handlooms; of mechanised over traditional techniques of processing farm produce, and rapid spread of mechanised forms of transport are cases in point. These changes have second round consequences tending to depress the growth of activity and employment in supporting activities.

On the other hand, the rapid expansion of public sector activity in rural areas has led to a steep rise in the number of people employed in rural areas directly by the government in administration and developmental activities. Moreover, expenditures on various developmental programmes (including anti-poverty programmes) generates incomes among their participants (including government functionaries and local leaders and their agents). The rapid expansion in public expenditure in rural areas is therefore a new and growing source of rural incomes which in turn generates successive rounds of increase in the demand for several non-agricultural products and services at least part of which are made locally. We do not however have the information necessary to estimate the extent of the expansion on these accounts, or its impact by region or even by state.

The extension and improvement of road network and transport facilities between rural and urban areas may have brought about some changes in the pattern of rural-urban migration. Better roads and modern means of transport reduce the time required for travel to and from nearby areas and also reduce the cost of such travel thus making it easier for workers to continue residing in their village homes and commute to their jobs in the nearby towns. The incentive for doing so would be stronger if the costs involved in the worker shifting residence to urban areas have risen. Again, the absence of information, this proposition is necessarily rather speculative.

That, along with these shifts, considerable changes in technology and organisation have taken place in rural industry and transport is apparent enough. The data from the decennial censuses suggest that the relative importance of household industry in rural industrial activity (proportion of workers in this sector) have declined substantially between 1961 and 1981 even as rural non-household industry has grown in absolute and relative terms. But it is impossible with the sketchy tabulations of the 1981 census currently available to say much about the specific segments of industry and regions where the shifts have occurred. (Eapen and Vaidyanathan : 1984)

The currently available information being inadequate even to get a reasonably definite picture of the trend in rural non-agricultural employment in different parts of India, it is even more problematic to relate them to changes in various factors discussed above. The decennial censuses of population show a fall in proportion of rural work force engaged in non-agricultural activities between 1961 and 1971, followed by a rise in 1981 but to a level below that of 1961. There are however well known problems of comparability of data between census which make them not quite dependable as the basis for judging trends. The NSS on the other hand has taken considerable care to ensure comparability of concepts and definitions especially since the early 1970's and is probably much more reliable. It points to substantial and sustained rise in the share of non-agricultural activities in rural employment during the seventies both at the national level and in a majority of the states. Seven out of the 16 states reported a decline in non-agricultural employment relative to total employment between 1972-73 and 1977-78, but all of them show a rise in 1983; in several cases the rise more than compensates for the earlier decline. (Table 17).

Table : 17 Changes in non-agricultural employment and unemployment in percentage of rural work force (males) 1972-73, 1977-78 and 1983-84

	1972-73 to 1977-78 change in			1977-78 to 1983 change in		
	Non-agricultural employment 1/	Foodgrain production	Unemployment rate 1/	Non-agricultural employment 2/	foodgrain production	Unemployment rate 2/
	% points 1	% 2	% points 3	% points 4	% 5	% points 6
AP	+ 1.8	+ 34	+ .3	+ 4.8	+ 28	+ .3
Assam	- 9.1	+ 2	- .2	+ 6.3	+ 11	+1.9
Bihar	- 1.2	+ 6	-1.4	+ 2.8	- 2	- .6
Gujarat	- 3.1	+ 75	+1.0	+ 4.5	+ 50	-1.1
Haryana	+ 5.4	+ 31	+3.5	+ 5.1	+ 29	+ .4
J & K	+ 7.2	+ 11	-2.7	+10.2	+ 1	+9.8
Karnataka	- 1.3	+ 58	+0.3	+ .8	+ 1	-1.8
Kerala	- .8	- 6	+2.6	+ 1.7	- 4	-3.6
MP	+ .9	+ 16	- .3	+ 2	+ 24	+ .1
Maharashtra	-10.8	+243	-2.2	+ 2.8	+ 5	+0.3
Orissa	- 1.8	+ 11	+ .2	+ 7.1	+ 23	+ .8
Punjab	+ 5.3	+ 35	- .0	+ 5.3	+45	+1.
Rajasthan	+ .6	+ 39	- .6	+ 4.2	+ 41	+1.6

(Contd. ...)

	1	2	3	4	5	6
Tamil Nadu	+ 6.6	+ 8	+ 6.7	+ 7.6	- 20	+ 5.2
Uttar Pradesh	+ 1.1	+17	+ 1.0	+ 2.3	+ 38	- .4
est Bengal	+ .8	+32	- .2	+ 5.3	+ 4	+ 7.1

1 Relates to population in the agr group 15-59 years. 1972-73 estimates are from the 28th round of NSS. 1977-78 estimates are from the 32nd round of NSS. Sarvakshana

2 Relate to population aged 5 years or more estimates for 1977-78 from Sarvekshana January - April 1981 and for 1983, NSS Report No.315.

Note The correlation coefficients between change in onon-agricultural employment on the one hand hand and the changes in foodgrain output and unemployment on the other are as follow:

	1972-77	1977-83	Combined
Foodgrain output	-.55	-.11	
Unemployment	.38	.87	

Between 1972-73 and 1977-78 practically all states recorded a rise in agricultural production, and yet several recorded a decline in the ratio of non-agricultural to total employment. With the significant exception of Maharashtra and Gujarat, the states in the latter category recorded relatively marginal rise in output. There is no association between the direction of change in unemployment rate and in non-agricultural employment during this period.

Between 1977-78 and 1983 on the other hand, practically all states report a rise in the non-agricultural employment ratio, including those which have experienced little or no increase in foodgrain production. Again there is no strong association between growth of foodgrain production and changes in the ratio of non-agricultural to agricultural employment. The latter however seems to be a positively correlated with change in rural unemployment - the correlation coefficient being high (.87) and significant. That is an increase in unemployment has generally gone with a rise in the ratio of non-agricultural employment.

Conclusions

While the above findings seem to offer some support to the residual sector hypothesis, the question remains why the non-agricultural sector fails to absorb all the available labour in excess of agriculture's needs. Could it be that the observed pattern of association between unemployment and non-agricultural employment reflects structural changes which go with commercialisation and the growth of wage labour force? There seems to be some basis to such an interpretation in as much as the unemployment rates happen to be positively and significantly correlated with the incidence of wage labour and with the degree of

commercialisation : the latter two factors are themselves positively correlated.[1] If forces resulting in greater commercialisation lead to an increase in the incidence of wage labour and casualisation of wage labour, the concomitant breakdown of traditional mechanisms to take care of the "surplus labour" leads to latent unemployment coming more and more into the open. The very same process could, as explained earlier, lead to a greater specialisation and differentiation of tasks performed within the rural labour force resulting in a rise in the reported distribution of employment in non-agricultural activities relative to agriculture. Which of those interpretations is nearer the truth cannot be established without much more disaggregated data on the pattern of regional variation, supplemented by detailed micro studies of the pattern of employment, structure of the labour market and the way they change in different types of situations.

1/ From Table 13, the correlation between unemployment rate and incidence of wage labour is calculated at 0.71; the co-efficient of correlation between unemployment and degree of monetisation of consumption is 0.81; and between the latter and the incidence of wage labour 0.71. Some caution is needed in interpreting these correlations because monetisation of consumption does not give a complete picture of commercialisation and also because it is based on rather old data.

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